s18quiz: EXP LOG (SLTN v276)
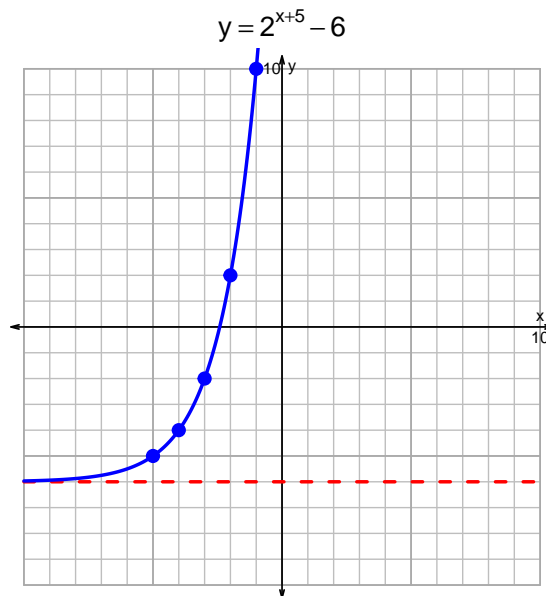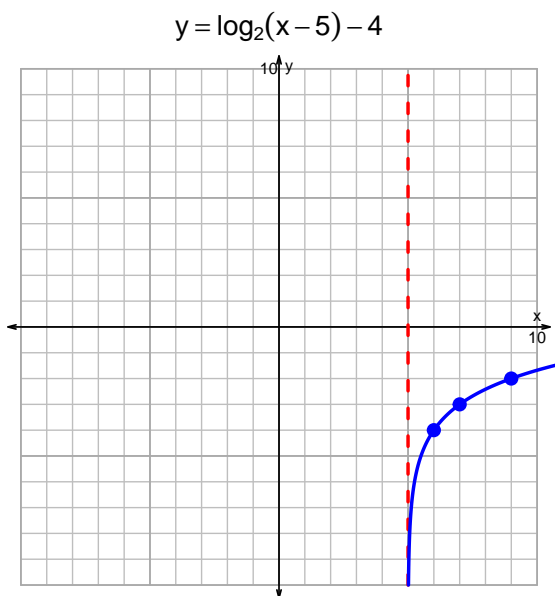
1. Graph $y = \log_2(x - 5) - 4$ and $y = 2^{x+5} - 6$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = \log_2(x - 5) - 4$$

$$y = 2^{x+5} - 6$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$13 = \left(\frac{7}{3}\right) \cdot 10^{-5t/4}$$

Divide both sides by $\frac{7}{3}$.

$$\frac{13 \cdot 3}{7} = 10^{-5t/4}$$

Take log, base 10, of both sides.

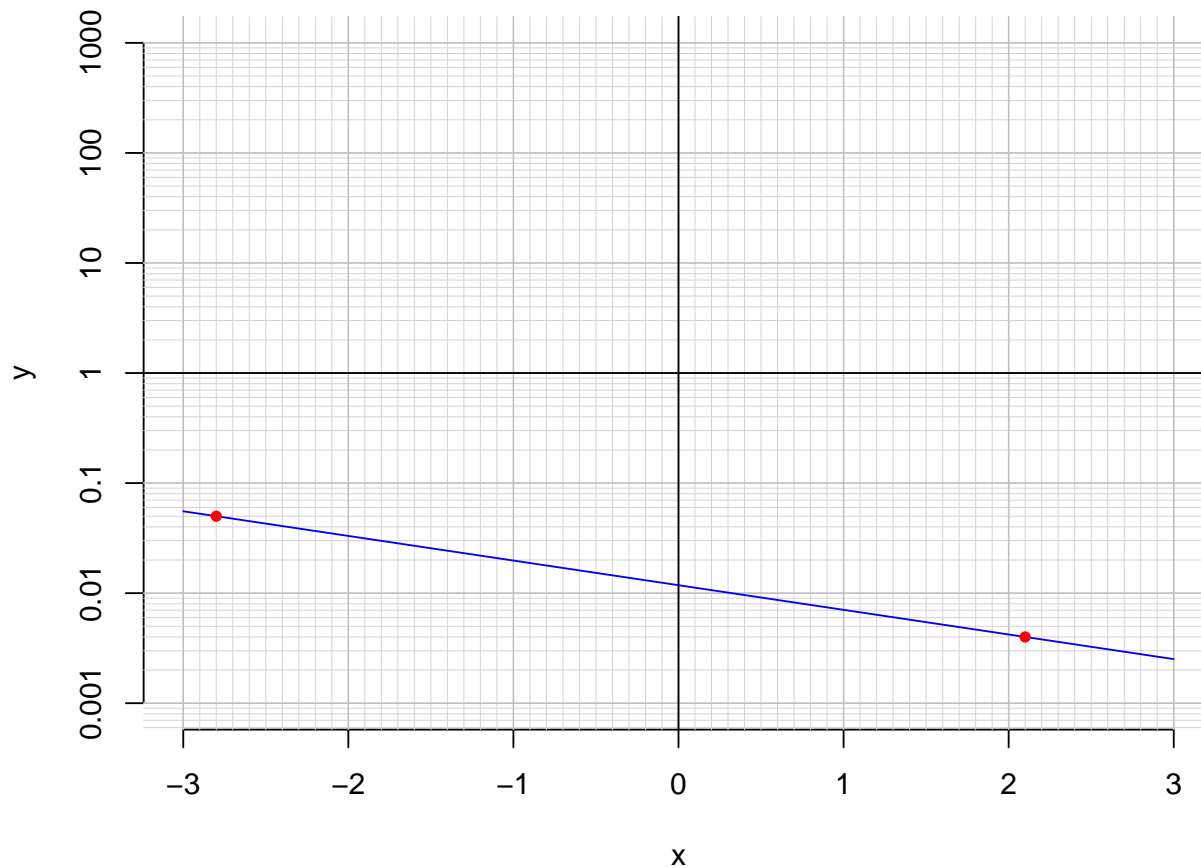$$\log_{10}\left(\frac{13 \cdot 3}{7}\right) = \frac{-5t}{4}$$

Divide both sides by $\frac{-5}{4}$.

$$\frac{-4}{5} \cdot \log_{10}\left(\frac{13 \cdot 3}{7}\right) = t$$

Switch sides.

$$t = \frac{-4}{5} \cdot \log_{10}\left(\frac{13 \cdot 3}{7}\right)$$

3. An exponential function $f(x) = 0.0118 \cdot e^{-0.515x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(2.1)$.

$$f(2.1) = 0.004$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{0.515} \cdot \ln\left(\frac{x}{0.0118}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.05)$.

$$f^{-1}(0.05) = -2.8$$